CLAIMS:

- 1 A pad wear compensation apparatus for a disc brake caliper, the disc brake
- 2 caliper having a housing containing a pair of opposing brake pad assemblies configured to reside on opposite sides of a disc operatively associated therewith, at least one brake pad
- assembly being advanced and retracted relative to the disc by a drive mechanism along an advancement axis to effect braking, the pad wear compensation apparatus being operatively
- 6 associated with at least one of the brake pad assemblies to advance the brake pad assembly along the advancement axis as it wears, the pad wear compensation apparatus comprising:
- 8 an adjustment knob attached to the housing for rotation about a rotation axis but fixed against axial movement; and
- a rotary to linear linkage between the at least one brake pad assembly and the knob providing axial advancement of the brake pad assembly relative to the housing upon axial rotation of the knob in a select direction.
 - 2. The pad wear compensation apparatus of claim 1 further comprising:
- an indicator visually observable outside the housing, the indicator being operatively associated with the rotary to linear linkage to advance with the brake pad assembly as the adjustment knob is rotated in the select direction.
- 3. The pad wear compensation apparatus of claim 1 where in the rotation axis and the advancement axis are the same.
- 4. The pad wear compensation apparatus of claim 2 wherein the indicator extends 2 into a hole in the knob.
- The pad wear compensation apparatus of claim 2 wherein the rotation axis andthe advancement axis are the same and the visual indicator extends into a hole in the knob along the rotation axis.

- 6. The pad wear compensation apparatus of claim 2 wherein the rotary to linear
- linkage comprises the indicator having a leading portion within the housing and a trailing portion extending into a hole in the knob along the rotation axis, the trailing portion and the
- 4 hole being configured to permit axial movement of the indicator relative to the knob but to prevent radial movement of the indicator relative to the knob so that as the knob is rotated
- 6 about the rotation axis the indicator is rotated about the rotation axis.
- 7. The pad wear compensation apparatus of claim 6 wherein the rotary to linear
- 2 linkage further comprises threads on the leading portion of the indicator, the threads engaging complimentary threads within the housing that are fixed against radial movement relative to
- 4 the indicator and fixed against movement along the advancement axis relative to the brake pad assembly, whereby as the knob is rotated in the select direction the indicator is advanced
- 6 along the advancement axis relative to the housing.
- 8. The pad wear compensation apparatus of claim 7 further comprising means for
- 2 linking the indicator to the brake pad assembly, whereby as the indicator is advanced along the advancement axis the brake pad assembly is advanced.
- 9. The pad wear compensation apparatus of claim 1 further comprising means
- 2 operatively associated with the knob for providing a tactile indication of advancement of the brake pad assembly along the advancement axis a select amount as the knob is rotated in the
- 4 select direction.
 - 10. The pad wear compensation apparatus of claim 9 wherein the tactile indication
- 2 means comprises indexing knurls within the housing that are fixed against rotation relative to the knob and complimentary detents operatively associated with the knob engaging the
- 4 knurls as the knob is rotated relative to the detents.

- 11. The pad wear compensation apparatus of claim 2 further comprising means operatively associated with the knob for providing a tactile indication of advancement of the brake pad assembly along the advancement axis a select amount as the knob is rotated in the
- 4 select direction.
- 12. The pad wear compensation apparatus of claim 11 wherein the tactile
- 2 indication means comprises indexing knurls within the housing that are fixed against rotation relative to the knob and complimentary detents operatively associated with the knob engaging
- 4 the knurls as the knob is rotated relative to the detents.

10

12

14

13. A mechanical disc brake caliper comprising:

2 a housing;

first and second opposing brake pad assemblies each having a leading brake pad
within the housing configured to reside on opposite sides of a disc operatively associated
therewith;

a drive within the housing operatively associated with the first brake pad assembly for advancing and retracting the first brake pad assembly relative to the disc along an advancement axis to effect braking by advancing the leading brake pad into contact with the disc; and

a pad wear compensation apparatus operatively associated with the first brake pad assembly to advance the brake pad assembly along the advancement axis as the brake pad wears, the pad wear compensation apparatus comprising:

an adjustment knob attached to the housing for rotation about a rotation axis;

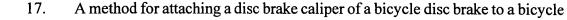
an indicator having a leading portion within the housing and a trailing portion engaging the knob along the rotation axis, the trailing portion and the knob being configured to permit axial movement of the indicator relative to the knob but to prevent rotational movement of the indicator relative to the knob so that as the knob is rotated about the rotation axis the indicator is rotated about the rotation axis and threads on the leading portion of the indicator, the threads engaging complimentary threads attached to the drive that are fixed against radial movement relative to the indicator and fixed against movement along the advancement axis relative to the drive, whereby as the knob is rotated in a select direction the indicator is advanced along the advancement axis relative to the drive; and

a link between the indicator and the first brake pad assembly, whereby as the indicator is advanced along the advancement axis the first brake pad assembly is advanced.

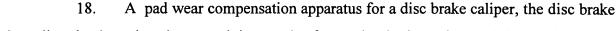
14. The mechanical disc brake caliper of claim 13 wherein the knob has an orifice
2 that extends through the knob along the rotation axis and a the distal end of the indicator is axially received therein, the orifice and the distal end of the indicator being configured to
4 allow axial movement of the distal end within the orifice but to prevent rotational movement

of the distal end relative to the knob, the distal end of the indicator being visually observable through the orifice to provide a visual indication of how far the pad assembly is advanced.

- 15. The mechanical disc brake caliper of claim 13 further comprising means operatively associated with the knob for providing a tactile indication of advancement of the brake pad assembly along the advancement axis a select amount as the knob is rotated in the select direction.
- 16. The pad wear compensation apparatus of claim 13 wherein the tactile
 2 indication means comprises indexing knurls within the housing that are fixed against rotation relative to the knob and complimentary detents operatively associated with the knob engaging
 4 the knurls as the knob is rotated relative to the detents.



- frame, the caliper having a caliper housing, a pair of brake pads within the housing positioned to receive a planar brake disc operatively associated with the caliper therebetween, and a drive
- 4 for advancing at least one brake pad into contact with the disc along an advancement axis, the method comprising:
- providing a pad wear compensating means within the housing for advancing and retracting the pads along the advancement axis relative to the housing;
- providing an attachment structure between the caliper housing and the bicycle frame allowing for infinite variation of an angle incidence between the advancement axis and the plane of the disc;
- advancing the pads relative to the housing into flush contact with the disc by using the pad wear compensating means;
- with the pads advanced into flush contact with the disc, securing the attachment structure to prevent movement of the caliper housing relative to the frame; and
- retracting the pads using the pad wear compensating means a select distance from the disc to allow for free rotation of the disc between the pads.



- caliper having a housing containing a pair of opposing brake pad assemblies configured to reside on opposite sides of a disc operatively associated therewith, at least one brake pad
- 4 assembly being advanced and retracted relative to the disc along an advancement axis by a drive to effect braking, the pad wear compensation apparatus being operatively associated
- with at least one of the brake pad assemblies to advance the brake pad along the advancement axis as it wears, the pad wear compensation apparatus comprising:
- 8 an adjustment member attached to the housing for rotation about a rotation axis;
- a rotary to linear linkage between the at least one brake pad assembly and the adjustment member providing axial advancement of the brake pad assembly relative to the housing upon axial rotation of the knob in a select direction; and
- means operatively associated with the knob for providing a tactile indication of advancement of the brake pad assembly along the advancement axis a select amount as the knob is rotated in the select direction.
- 19. The pad wear compensation apparatus of claim 18 wherein the tactile
 2 indication means comprises indexing knurls within the housing that are fixed against rotation relative to the adjustment member and complimentary detents operatively associated with the
 4 knob engaging the knurls as the adjustment member is rotated relative to the detents.
- 20. The pad wear compensation apparatus of claim 18 wherein the adjustment member is fixed against axial movement in relation to the rotation axis.

